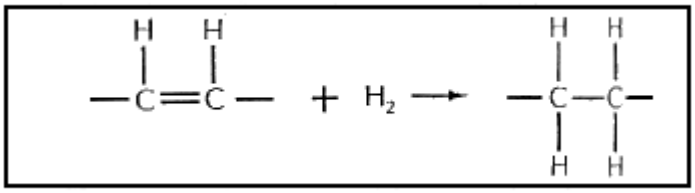
C-3.10 Classify organic reactions as addition, elimination, or condensation. (additional content/depth)

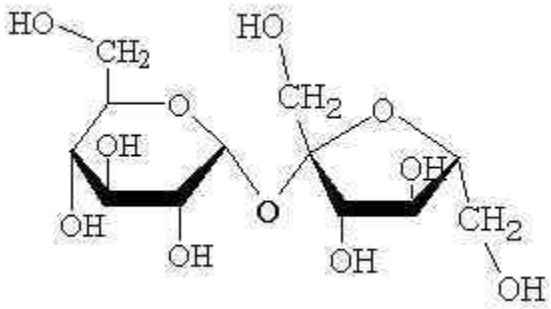
Revised Taxonomy Level 2.3 B (Classify conceptual knowledge)

Students did not address this topic in physical science
It is essential for students to

- Understand that an addition reaction is one in which an atom or molecule is added to an unsaturated molecule (one that has double or triple bonds) and increased the saturation of the molecule.
  - An example is the hydrogenation of vegetable oil



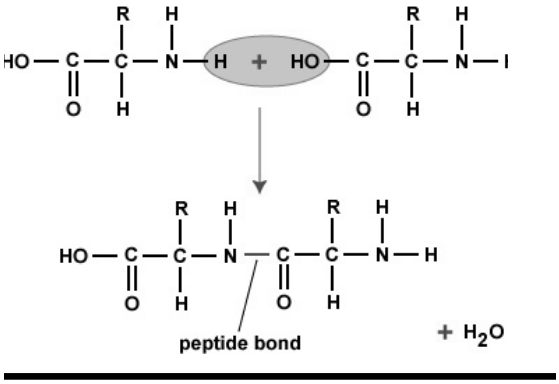
- Understand that an elimination reaction is one in which a simple molecule, such as water or ammonia, is removed from adjacent carbon atoms of a larger molecule.
  - An example is the dehydration of sucrose in the presence of sulfuric acid



Sucrose

$$C_{12}H_{22}O_{11\,(s)} \xrightarrow{H_2SO_4} 12C_{(s)} + 11\,H_2O_{(g)}$$

- Understand that a condensation reaction is one in which two molecules or parts of the same molecule combine.
  - An example of a condensation reaction is the formation of a protein from two amino acids



Protein

Assessment

As the indicator states, the major focus of assessment is to classify organic reactions. As the taxonomy verb is classify as opposed to distinguish, the assessment item should include all of the relevant information that is needed to make the distinction between categories, so the types of reactions should be illustrated with structural formulas, diagrams or with verbal descriptions. As the indicator has a cognitive dimension of conceptual knowledge, assessment items should require that students understand each of these categories in terms of the "interrelationships among the basic elements within the category", in other words students must show that they understand the criteria for each category.